

Appl. No. 10/748,315
Amtd. Dated August 7, 2006
Reply to Office Action of July 20, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A surface lighting device for a display device, comprising:

a light guide plate having a light incident surface;

a point light source opposite to the light incident surface; and

a micro-lens located between the point light source and the light incident surface, the micro-lens being configured for collimating divergent rays emitted from the point light source into parallel rays, the micro-lens comprising a concave surface facing the point light source and a convex surface opposite to the light incident surface:

wherein the light guide plate and the point light source are placed at respective working distances from the micro-lens, whereby the divergent rays emitted from the point light source are coupled into the light incident surface via the micro-lens.

Claim 2 (original): The surface lighting device as described in claim 1, wherein the micro-lens has a superconic cross-section.

Claims 3-4 (canceled).

Claim 5 (original): The surface lighting device as described in claim 1, wherein the point light source is a light emitting diode or a miniature bulb.

Claim 6 (original): The surface lighting device as described in claim 1, wherein the light guide plate is parallelepiped-shaped, wedge-shaped, or has a

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triangular profile.

Claim 7(previously presented): The surface lighting device as described in claim 1, wherein the light guide plate further comprises a light output surface adjoining the light incident surface, and a bottom surface opposite to the light output surface.

Claim 8 (original): The surface lighting device as described in claim 7, wherein the bottom surface has a dot pattern thereon, or has a plurality of v-cut grooves therein.

Claim 9 (original): The surface lighting device as described in claim 7, wherein the light incident surface has an anti-reflective film thereon.

Claim 10 (currently amended): A liquid crystal display device comprising:

a liquid crystal panel; and

a surface lighting device arranged under the liquid crystal panel for illuminating the liquid crystal panel, the surface lighting device comprising:

point light sources for emitting light beams;

a light guide plate having a light incident surface for receiving the light beams and a light output surface for emitting the light beams; and

micro-lenses for coupling the light beams from the point light sources into the light incident surface, each of the micro-lenses comprising a concave surface facing a corresponding point light source and a convex surface opposite to the light incident surface;

wherein the micro-lenses are positioned between the point light sources and the light incident surface, and the light beams emitted from the point light sources are rendered non-divergent by the micro-lenses and coupled into the light incident surface via the micro-lenses.

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Claim 11 (original): The liquid crystal display device as claimed in claim 10, wherein the micro-lenses collimate the light beams from the point light sources such that the light beams coupled into the light incident surface are substantially parallel.

Claim 12 (original): The liquid crystal display device as claimed in claim 10, wherein each of the micro-lenses has a superconic cross-section.

Claims 13-14 (canceled).

Claim 15 (currently amended): A surface lighting device for a display device, comprising:

a light guide plate having a light incident surface;
at least one light source opposite to the light incident surface; and
a lens located between the light source and the light incident surface,
the lens being configured for collimating divergent rays emitted from the
light source into non-divergent rays, the lens comprising a concave surface
facing the at least one light source and a convex surface opposite to the light
incident surface;

wherein the light guide plate and the point light source are placed at respective working distances from the lens, whereby the divergent rays emitted from the light source are coupled into the light incident surface via the lens.

Claim 16 (previously presented): The surface lighting device as described in claim 15, wherein said coupled non-divergent rays are essentially parallel to each other.

Claim 17 (previously presented): The surface lighting device as described in claim 16, wherein the parallel rays are perpendicular to the light incident surface.